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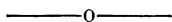
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if to tear it, but abandoned the task. Did she find the covering too tough, or perceive the difference of species? It seems to me that the various speculations as to the manner in which the nurses know when to deliver the pupæ, may reasonably be set aside and the above conclusion accepted. Certainly, the kicking of the imprisoned antling is apparent enough to attract even the most stupid nurse, and the vigor of the motions, perhaps even the beginning of them, might easily give warning of the proper time for cutting the envelop. I am inclined to think, from some observations made, that the head of the pupa is released first; if so, the position of the legs would enable the antling, by pushing and stretching, to aid largely in its own release.

A worker of *F. Pennsylvanica* was placed within a paper box with a cocoon which she had seized. At the end of a week she had delivered her nursling, which, however, was dead when observed, although the worker was alive. This cocoon was opened at the head. None of the cocoons, kept separate from ants, were open. It is clear that the pupæ cannot release themselves without the aid of the worker. Some of the antlings above referred to, when released by me, were quite developed, of normal size and color, and walked off with much vigor. Yet in the course of a month or more they were not able to secure liberty by their unaided effort. There is no appearance of swathing that could probably prevent free action of the limbs; the only thing resembling this being a light filament which unites the thorax and the abdomen, passing over and around the scale.

Of the larvæ three sizes were found. The most numerous were evidently those of the dwarfs, soft, small white grubs. The others were nearly of the same length, and differed mainly in size, one form having more plumpness than the other. These grubs (Pl. IV, fig. 11,) were of faint straw color, or livid.



### **New Species of DIURNAL LEPIDOPTERA.**

BY W. H. EDWARDS.

#### ***Argynnis Alcestis.***

Primaries much produced, strongly arched, the hind margin slightly concave.

*Male*.—Expands 2.7 inch. Upper side uniform bright red-fulvous, scarcely obscured by brown at base; hind margins bordered by two parallel lines, on the inner side of which, on primaries, are spots, lunate next apex, elsewhere serrate, and lunate on secondaries; other markings as in *Aphrodite*, the discal band of secondaries not being

confluent, but composed of widely separated lunate spots; fringes of primaries alternately fuscous and yellowish, in equal parts, of secondaries yellowish, with fuscous only at the end of the nervules.

Under side of primaries fiery red, except next apex, where the whole area is chocolate-brown; the hind margin broadly bordered with nearly same shade of brown; the spots resting on this are serrate or lanceolate, those on the apical half of the wing inclosing well silvered spaces, the others brown; there are also three sub-apical silver spots, as in most of the allied species, and in addition, the rounded black spots on the lower discoidal and two median inter-spaces often have their outer edges silvered; other examples differ in that the color of the ground is cinnamon-red, and the area between cell and median nervule to apex, buff, the nervules well covered with red, and sometimes the whole buff space is washed with faint red; there is then also a large brown sub-apical patch.

Secondaries of one uniform color from base to margin, either dark chocolate-brown, or deep ferruginous-brown, with no mottling of other colors on the disc; occasionally, in the middle of the space between the two outer rows of spots, there is a narrow strip which shows a buff sub-color, washed by the prevailing shade of the wing; and sometimes this buff is distinct; the spots conspicuous for size, and well silvered; those of the outer row sub-triangular, edged above with a broad border of the ground color; the second row, consisting of eight spots, has the first three, and the fifth and sixth, nearly equal, obovate; the fourth small, triangular; the seventh sub-lunate; the eighth on inner margin, sometimes wanting, but when present, of same size and shape as the seventh; in the third row are five spots; these, as well as the spots of second row heavily edged with black on basal side; in the cell either one or two round spots, and below cell an oval, all ringed with black; there are also three spots in the inter-spaces next base; shoulder and inner margin well silvered.

Body above red-fulvous; below, the thorax buff, with fulvous hairs; the abdomen reddish-buff; legs reddish-buff; palpi buff, fulvous in front and at tip; antennæ black, fulvous on under side; club black, tipped with fulvous.

*Female*.—Expands 3.5 to 4 inches. Upper side darker than the male, less bright, more obscured by brown at base; the marginal lines heavy, and more or less confluent on primaries; the sub-marginal spots also unite with the band, and are enlarged, and the fulvous spaces inclosed are not paler than the ground color elsewhere; all the

marks and inscriptions heavier than in the male; on secondaries the discal band is either of separated lunules, but larger and nearer together than in the male, or the posterior half of the band is confluent, while the outer remains separated.

Under side of primaries deep red, passing into dark brown near the apex; the silver spots as in the male; secondaries wholly dark-ferruginous, or often olive black, as in *Idalia*, with no pale band between the outer rows of spots; the spots large and well silvered.

*Egg*.—Of same general pattern as the eggs of *Cybele*, *Aphrodite*, and other of our large species of *Argynnis*, but longer in proportion to the breadth than in any of them so far known, the sides straighter also and less rounded. Laid upon violet. The larva emerges in about twenty-four days, and hibernates in its first stage. It cannot be distinguished at this stage from the larva of either of the species named.

This species is found in Northern Illinois, Iowa and Colorado, and has been regarded as a variety of *Aphrodite*. I have examined large numbers of examples the past season, and am satisfied of its distinctness. The coloration of the under side of secondaries is remarkable, many of the females resembling *Idalia* in this respect, while other females and the males are covered with one uniform shade of bright or dark-ferruginous brown, free from all mottling like that seen in *Aphrodite*.

### **Chrysophanus Nais.**

*Male*.—Expands 1.4 inch. Upper side yellow-fulvous, spotted and shaded with black; hind margins edged by a black line, and a paler narrow border, followed by a common fulvous belt, on the posterior edge of which is a series of rounded black spots, of equal size, and completely crossing each wing; next preceding is a common, narrow black band, wavy on the inner half of primaries, and all of secondaries; from this to base primaries have the ground fulvous, but blackened on both margins; secondaries have the corresponding area fuscous, except the cell, and a narrow extra-discal belt, which are fulvous; both wings crossed by a discal row of rounded spots; at the extremity of each cell a black transverse bar, and three others within, near the middle, and in a group; also below each cell are three similar bars; fringes black and white in irregular areas.

Under side of primaries orange, except a little spot of buff, quite at the margin in each interspace, and a sub-apical stripe of same color reaching nearly to end of cell; the hind margin edged by a heavy

black line; the sub-marginal spots of upper side repeated, somewhat reduced; the black band represented by a line of sub-quadrated spots; the discal row also repeated, the lower three or four spots being elongated and set obliquely; the spots in and below cell also repeated, reduced. Secondaries yellowish, or sordid white; the margin and the next two rows of spots as in primaries, the space between these rows being orange, forming a conspicuous belt, fading into the ground as it approaches the outer angle; an irregular row of small spots crosses the disc, and on the inner side of this, against the cell, and also in submedian interspace is an orange discoloration; the spots in and below the cell repeated, reduced.

Body above fuscous, below yellowish, both thorax and abdomen; legs buff; palpi whitish; antennæ annulated black and white; club black, reddish at tip.

*Female*.—Expands 1.5 inch. Marked as in the male, but the color brighter; the fulvous space next preceding the fuscous band is partly replaced by white, especially next the costa and the inner margin; on the under side the orange is brighter; the sides of the abdomen fulvous.

From one ♂ taken several years ago in Southern California, by Dr. Smart, and a ♀ recently received from Prescott, Arizona.

This species is very distinct in its markings above from any of our species, but below resembles somewhat *Thoe*. It is similar in shape and size to that species.

### **Hesperia Deva.**

*Female*.—Expands 2 inches. Upper side uniform glossy brown, rather light in tint; primaries have three translucent spots, sub-apical, small, round, equal, in a straight line depending from costa; a fourth slightly larger than these near the top of the upper median interspace, and a fifth an elongated narrow bar, in the next below, a little nearer base than the fourth; both these completely cross the interspaces; secondaries immaculate, fringes concolored.

Under side slightly paler in tint, darker on the disc of primaries and up to base, lighter next inner angle; the spots repeated; secondaries immaculate. Body above dark-brown, below, the thorax gray buff, the abdomen brown; palpi white; antennæ annulated, brown and dull white; club black, reddish at tip.

From a single example received from Prescott. The species is allied to *Accius*.